NEW SPECIES OF EUGENIA (MYRTACEAE) FROM ECUADOR

Maria Lúcia Kawasaki

Department of Botany
Field Museum of Natural History
1400 South Lake Shore Drive
Chicago, Illinois 60605-2496, U.S.A.
Ikawasaki@fieldmuseum.org

Bruce K. Holst

Marie Selby Botanical Gardens 811 South Palm Avenue Sarasota, Florida 34236, U.S.A. bholst@selby.org

ABSTRACT

Five new species of Eugenia (Myrtaceae) from Ecuador are described and illustrated: Eugenia aequatoriensis, E. castaneiflora, E. crassimarginata, E. longisepala, and E. pusilliflora.

RESUMEN

Se describen y se ilustran cinco especies nuevas de Eugenia (Myrtaceae) del Ecuador: Eugenia aequatoriensis, E. castaneiflora, E. crassimarginata, E. longisepala y E. pusilliflora.

INTRODUCTION

In the checklist of Myrtaceae of Ecuador (Holst 1999), ca. 60 species of Eugenia were reported; approximately 30 species represented possible new taxa and some of these have been recently described (Kawasaki & Holst 2009). In preparation of the Myrtaceae treatment for the Flora of Ecuador, five additional new species of Eugenia are here described: Eugenia aequatoriensis, E. castaneiflora, E. crassimarginata, E. longisepala, and E. pusilliflora.

Eugenia aequatoriensis M.L. Kawasaki & B.K. Holst, sp. nov. (**Fig. 1**). Type: ECUADOR. Loja: Bosque 'El Tundo', property of ARCOIRIS foundation, on track off road Sozoranga–Macará, ca. Km 1, 4°19'29.4"S, 79°49'13.9"W, 1750 m, 12 Jun 1996 (fl), B.B. Klitgaard, B. Ståhl, P. Lozano, T. Delgado, F. Elizalde, H. Aleyandro & F. Tinitana 173 (HOLOTYPE: AAU; ISOTYPES: NY, QCA, SEL).

Frutex vel arbor; foliis ellipticis vel anguste ellipticis; racemis pubescentibus, indumento brunneo-rufescenti vel rubro-flavescenti, pedicellis plerumque inflorescentiis axibus longioribus; fructis ellipsoideis vel obovoideis.

Shrub or tree 3–25 m tall; trichomes, where present, brownish- or yellowish-red. **Leaf blades** elliptic to narrowly elliptic, chartaceous to coriaceous, $9-13.5 \times 3-6.5$ cm, mostly glabrous, drying olive-green or greenish-brown above, paler below; glands punctiform, indistinct above, dark and numerous below; midvein sulcate on the upper surface; lateral veins 10-15 pairs, indistinct or slightly convex above, convex below; marginal veins 2, the innermost slightly arched, 1-3 mm from the margin; apex acute to shortly acuminate; base cuneate; petioles 1-1.5 cm long, sulcate, glabrous. **Inflorescences** of short racemes, with up to ca. 6 flowers, axillary or subterminal, the main axis 3-13 mm long, the pedicels 4-13 mm long, appressed-pubescent; bracteoles triangular, acute, to 1 mm long, appressed-pubescent, persistent. **Flowers** 4-merous; buds 3-4 mm long; hypanthium ca. 2 mm long, appressed-pubescent; calyx lobes suborbicular, 2-3 mm long, obtuse, appressed-pubescent; petals suborbicular, ca. 4 mm diam., ciliate; disk ca. 3 mm diam., glabrous; stamens ca. 4-6 mm long; style ca. 6 mm long; ovary 2-locular, with several ovules per locule. **Fruits** berries, ellipsoid or obovoid, $1.3-1.5 \times 1-1.1$ cm, puberulous to glabrous, reddish; seed 1, ca. 10×8 mm, the seed coat membranous; embryo eugenioid, the cotyledons fleshy, connate, the radicle indistinct.

Distribution.—Known only from the region of Reserva Natural El Tundo, Sozoranga, Loja province, in wet premontane forests at 1750–1800 m elevation.

Among the species of *Eugenia* with racemose inflorescences in Ecuador, *E. aequatoriensis* is readily distinguished by the short, brownish- or yellowish-red pubescent racemes, with the main axis 3–13 mm long and a few (up to ca. 6), long-pedicellate flowers, the pedicels 4–13 mm long, often longer than the main

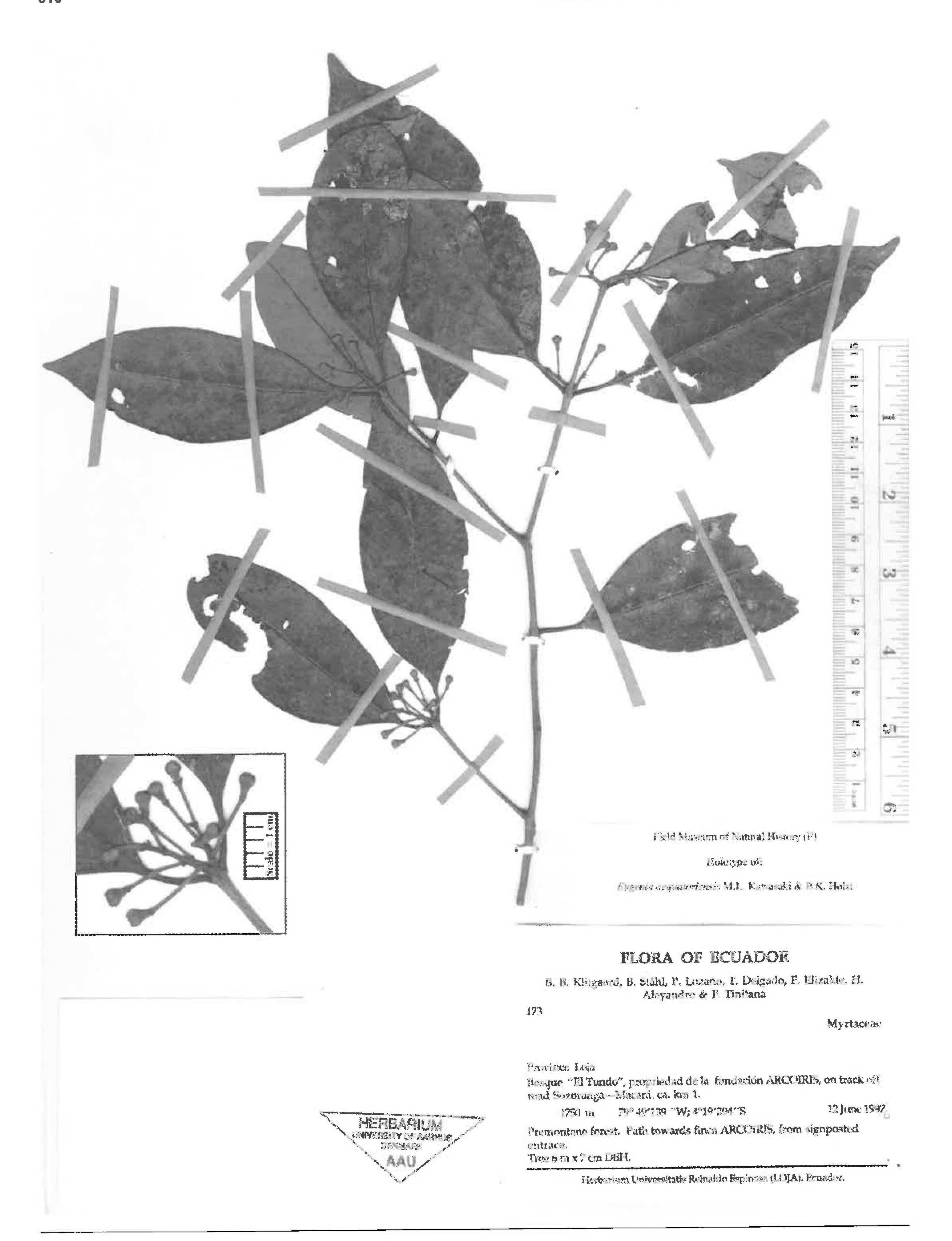


Fig. 1. Eugenia aequatoriensis M.L. Kawasaki & B.K. Holst (Klitgaard et al. 173: Holotype, AAU).

axis of the inflorescences. While *E. aequatoriensis* is distinct among Neotropical Myrtaceae, its affinities are not clear.

Additional collections examined: **ECUADOR. Loja:** Sozoranga, Reserva Natural El Tundo, property of ARCOIRIS foundation, Km 6 along track from Sozoranga–Macará road, 4°19'S, 79°49'W, 1800 m, 19 Aug 1997 (fr), *G.P. Lewis et al.* 3492 (AAU); Sozoranga, El Tundo, Mar 1983 (fl), *F. Vivar C. et al.* 1727 (AAU, LOJA).

Eugenia castaneiflora M.L. Kawasaki & B.K. Holst, sp. nov. (Fig. 2). Type: ECUADOR. Manabi: Pedernales, 34 km N of Pedernales along new coastal highway, near village of Chindul, 00°14'S, 79°52'W, 60 m, 28 Aug 1998 (buds), D. Neill & QCNE botany interns 11447 (holotype: MO; isotypes: F, QCNE).

Frutex vel arbor; foliis anguste ellipticis vel oblanceolatis, 27–39 cm longis, coriaceis, glabrescentibus, acuminatis, nervo medio supra convexo vel biconvexo; floribus fasciculatis, castaneo-tomentosis; fructis ellipsoideis.

Shrub or tree 3–7 m tall, the trichomes on branchlets, petioles, and inflorescences chestnut-brown, yellowish-brown on leaf blades. **Leaf blades** narrowly elliptic or oblanceolate, coriaceous, 27–39 × 7–10 cm, drying greenish-brown or brownish, much paler below, glabrescent, the few trichomes by the midvein on the lower surface; glands punctiform, almost indistinct on both surfaces or slightly convex below; midvein convex or biconvex on the upper surface; lateral veins 20–25 pairs, convex on both surfaces; marginal veins 2, the innermost slightly arched, 2–5 mm from the margin; apex acuminate; base obtuse; petioles 1–1.5 cm long, flattened, puberulous to tomentulose. **Inflorescences** of abbreviate racemes, with up to 10 flowers, the main axis inconspicuous; flowers appearing fasciculate at leafless nodes, the pedicels 1–1.5 cm long, tomentose; bracteoles lanceolate, 2–4 mm long, tomentose, persistent. **Flowers** 4-merous; buds 9–10 mm long, tomentose; hypanthium ca. 4 mm long; calyx lobes suborbicular, 5–7 mm long, obtuse, apparently deciduous in fruit; fully developed petals, stamens, and style not seen; disk ca. 3 mm diam., glabrous; ovary 2-locular, with several ovules per locule. **Fruits** berries, ellipsoid, 3–4 × 1.5–1.8 cm, puberulous, glabrescent, gland-dotted, crowned by a tomentose collar; seeds 1(2), (1–)2.5 × (0.5–)1 cm; embryo eugenioid, the cotyledons fleshy, connate, the radicle indistinct.

Distribution.—Eugenia castaneiflora is known only from Manabí province, occurring in wet forests at 60–250 m elevation.

In leaf morphology and type of inflorescence, *Eugenia castaneiflora* is similar to *E. tumulescens* McVaugh, a species from northern Amazonian Brazil and southern Venezuela. In *E. castaneiflora*, however, the glands on leaves are punctiform and mostly indistinct (vs. prominently convex) on both surfaces, the petioles are smooth (vs. corky), the flowers are characteristically chestnut-brown (vs. yellowish-brown) and borne at leafless nodes (vs. axillary), the pedicels are 10–15 (vs. 8–10) mm long, and the calyx lobes are suborbicular (vs. oblong), 5–7 (vs. 6–8) mm long.

Additional collection examined: **ECUADOR. Manabí:** Pedernales Cantón, Reserva Ecológica Mache–Chindul, comunidad Ambacha (Chindul coastal highway), 250 m, 00°15′N, 79°48′W, 25 Mar 1997 (fr), *J.L. Clark et al.* 4152 (F, MO, QCNE, US).

Eugenia crassimarginata M.L. Kawasaki & B.K. Holst, sp. nov. (Fig. 3). Type: ECUADOR. Cotopaxi: Tenefuerste, Río Pilalo, Km 52–53, Quevedo, Latacunga, 750–1300 m, 7 Feb 1982 (old fl), C.H. Dodson & A.H. Gentry 12168 (HOLOTYPE: MO; ISOTYPES: SEL, US).

Arbor; foliis ellipticis, anguste ellipticis vel obovatis, chartaceis, plerumque glabris vel sparse adpresso-pubescentibus, abrupte acuminatis, crassimarginatis, venis marginalibus 4–8 mm remotis, nervo medio supra prominente; floribus fasciculatis; fructis ellipsoideis.

Tree 5–15 m tall; trichomes, where present, yellowish-white to coppery. **Leaf blades** elliptic to narrowly elliptic or obovate, chartaceous, $10-16 \times 4.5-7$ cm, drying olive-green, brown or dark-brown above, light greenish-brown below; upper and lower surfaces mostly glabrous to sparsely appressed-pubescent; glands punctiform, dark and convex on both surfaces; midvein convex on the upper surface; lateral veins 8–12 pairs, convex on both surfaces, but impressed on the upper surface and appearing strongly sulcate; marginal veins 2, the innermost similar to the lateral veins in prominence, slightly arched, 4–8 mm from the margin, the leaf blades appearing thick-marginate; apex abruptly acuminate, the acumen 1–2 cm long; base cuneate to obtuse; petioles 4–8 mm long, flattened, glabrous. **Inflorescences** of abbreviate racemes, with up to

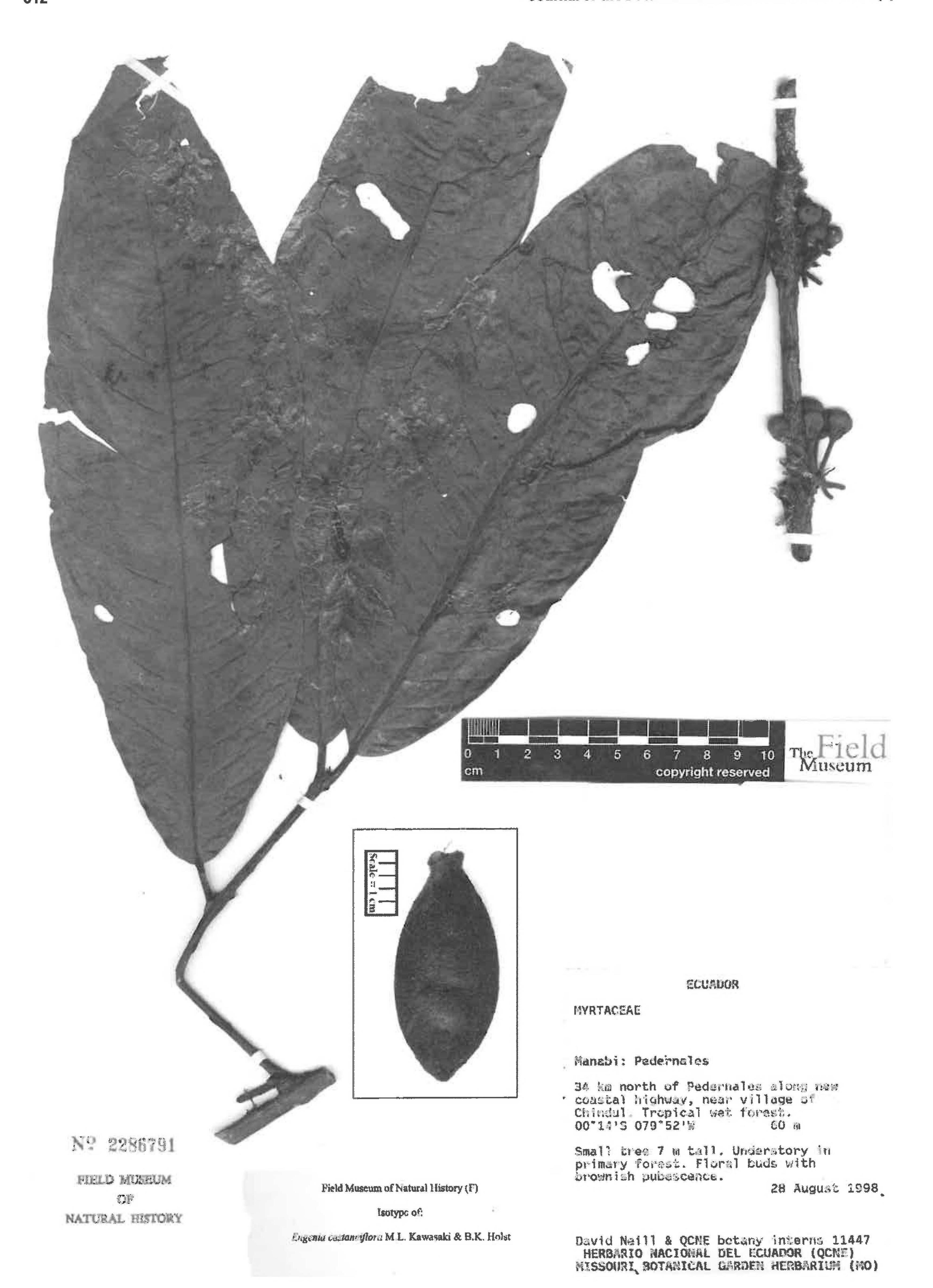


Fig. 2. Eugenia castaneiflora M.L. Kawasaki & B.K. Holst (Neill et al. 11447: Isotype, F; fruit from Clark et al. 4152, F).

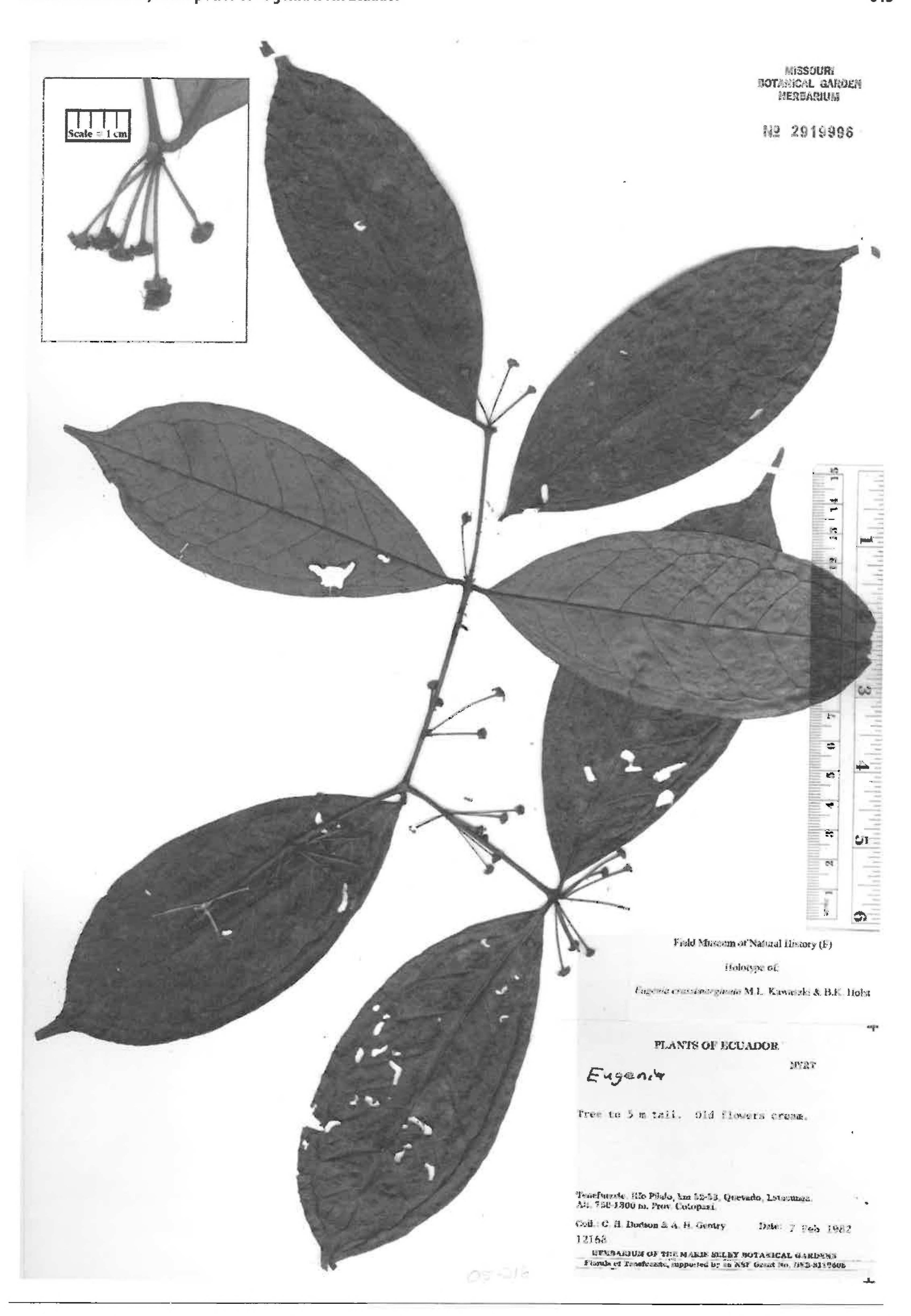


Fig. 3. Eugenia crassimarginata M.L. Kawasaki & B.K. Holst (Dodson & Gentry 12168: Holotype, MO; inset from isotype at SEL).

8 flowers, the main axis inconspicuous; flowers appearing fasciculate at leafless nodes, the pedicels 1–2.5 cm long, slender, appressed-puberulous to glabrous; bracteoles ovate, ca. 2 mm long, deciduous. **Flowers** 4-merous; buds not seen; hypanthium ca. 2 mm long, appressed-pubescent; calyx lobes ovate, ca. 2 mm long, obtuse, glabrous; petals not seen; disk ca. 2 mm diam., glabrous; stamens and style not seen; ovary 2-locular, with several ovules per locule. **Fruits** berries, ellipsoid, $1.5-2.5 \times 1-1.5$ cm, glabrous, greenish-brown, gland-dotted; seed 1, ca. 15×9 mm, the seed coat membranous; embryo eugenioid, the cotyledons fleshy, connate, the radicle indistinct.

Distribution.—Eugenia crassimarginata has been collected in the provinces of Cotopaxi, Los Ríos, and Pichincha, in forests at 500–1300 m elevation.

Eugenia crassimarginata is characterized by the upper surface of leaves with convex venation but immersed in the leaf blade, appearing strongly sulcate, the lateral veins joining in a continuous inner marginal vein at 4–8 mm from margin, and by the relatively small flowers borne on elongate, slender pedicels. Eugenia churutensis X. Cornejo, a species know only from lowland forests of Guayas province, has similar flowers and type of inflorescences, but each fascicle has 8–30 (vs. to 8) flowers, the bracteoles are narrowly triangular, 0.5–1 mm long, probably persistent (vs. ovate, ca. 2 mm long, deciduous), and the lateral veins join in irregular loops, not forming the characteristic marginal vein of E. crassimarginata.

Additional collections examined: **ECUADOR. Los Ríos:** Quevedo Cantón, Cerro Centinela, Montañas de Ila, 10 km E of Patricia Pilar, 00°37′S, 79°48′W, 500 m, 19 Jun 1991 (young fr), *W. Palacios & E. Freire 7452* (SEL). **Los Ríos/Pichincha:** Patricia Pilar, at 45 km on road from Santo Domingo to Quevedo, path following ridge line at El Centinela, at crest of Montañas de Ila, on road from Patricia Pilar to 24 de Mayo at Km 12, 600 m, 10 Jul 1979 (fr), *C.H. Dodson et al. 7799* (F, MO, SEL); Patricia Pilar, at 45 km on road from Santo Domingo to Quevedo, path following ridge line at El Centinela, at crest of Montañas de Ila, on road from Patricia Pilar to 24 de Mayo at Km 12, 600 m, 2 Oct 1979 (fr), *C.H. Dodson et al. 8686* (MO, SEL). **Pichincha:** Centinela, road Patricia Pilar–24 de Mayo, Km 12, ca. Km 47 of road Santo Domingo—Quevedo, at crest of Montañas de Ila, 650 m, 26 Jul 1984 (old fl/young fr), *C.H. Dodson et al. 14523* (MO, SEL).

Eugenia longisepala M.L. Kawasaki & B.K. Holst, sp. nov. (Fig. 4). Type: ECUADOR. Sucumbios: Sacha Lodge, 3 km N of the village Añangu, near the Napo river, 00°39'S, 76°26'W, 200 m, 12 Jun 1995 (fr), J.L. Clark, L. Demattia & T. Miller 1176 (HOLOTYPE: MO; ISOTYPES: F, US).

Arbor; foliis anguste ellipticis vel lanceolatis, 23–36 cm longis, coriaceis, plerumque glabris, nervo medio supra plano vel prominente; racemis pubescentibus, indumento brunneolo vel brunneo-flavescenti, calycis lobis lanceolatis, 10–13 mm longis; fructis ellipsoideis.

Tree 7–12 m tall; trichomes, where present, brownish to yellowish-brown. **Leaf blades** narrowly elliptic to lanceolate, coriaceous, $23-36 \times 7-13$ cm, drying olive-green to greenish-brown above, paler below; upper surface mostly glabrous; lower surface glabrous to thinly sericeous; glands punctiform, indistinct on both surfaces or slightly convex below; midvein plane to convex on the upper surface; lateral veins 17–20 pairs, convex on both surfaces; marginal veins 2, the innermost slightly arched, 3–7 mm from the margin; apex abruptly short-acuminate; base cuneate to obtuse; petioles stout, 2–2.5 cm long, sulcate, wrinkled, sparsely tomentulose, glabrescent. **Inflorescences** of short racemes, axillary, the main axis in fruit 1–2.5 cm long, the pedicels in fruit 6–10 mm long, pubescent; bracteoles not seen, deciduous. **Flowers** (loosen) 4-merous; buds not seen; hypanthium ca. 6 mm long, pubescent; calyx lobes lanceolate, 10–13 × 5 mm long, foliaceous, acute, pubescent; petals obovate, ca. 1 cm long, glabrous; disk 3–4 mm diam., glabrous; stamens ca. 7 mm long; style ca. 7 mm long; ovary 2-locular, with several ovules per locule. **Fruits** berries, ellipsoid, 2.5–3 × 1–1.5 cm, pubescent, greenish-brown, crowned by the elongate, involute calyx lobes; seed 1, ca. 2.3 × 1 cm, the seed coat membranous; embryo eugenioid, the cotyledons fleshy, connate, the radicle indistinct.

Distribution.—Eugenia longisepala is known from the provinces of Orellana and Sucumbios, occurring in wet forests at 200–360 m elevation.

Eugenia longisepala is similar to Eugenia macrocalyx (Rusby) McVaugh, a species from northern South America to Bolivia, in the uncommonly long and foliaceous calyx lobes. In *E. longisepala*, however, the inflorescences, pedicels, and flowers are stout (vs. slender), the trichomes are brownish to yellowish-brown (vs. whitish) and the leaves are much larger $(23-36 \times 7-13 \text{ cm vs. } 6-13 \times 3-5 \text{ cm})$, with a convex (vs. sulcate) midvein on the upper surface.



Fig. 4. Eugenia longisepala M.L. Kawasaki & B.K. Holst (Clark et al. 1176: Isotype, F; flower from Korning & Thomsen 58651, AAU).

Additional collections examined: **ECUADOR. Orellana**: Añangu, NW corner of the Parque Nacional Yasuní, surroundings of the SEF terra firme line and KTH hectar plot, 00°33'S, 76°22'W, 260–360 m, 1–30 Apr 1985 (fl), *J. Korning & K. Thomsen 58651* (AAU, QCA, QCNE); Estación Científica Yasuní, Río Tiputini, NW of confluence with Río Tivacuno, E of road Repsol–YPF, Km 7 on spur road to oil well Tivacuno, sendero Napo at 1400 m (left side), 00°38'S, 76°30'W, 200–300 m, 23 Jul 2002 (fr), *G. Villa & P. Alvia 1824* (AAU, QCA, US).

Eugenia pusilliflora M.L. Kawasaki & B.K. Holst, sp. nov. (Fig. 5). Type: ECUADOR. Napo: Tena Cantón, Biological Station Jatun Sacha, 8 km E of Misahuallí, near Chinguipino stream, permanent parcel 03, 01°04'S, 77°36'W, 400 m, 16 Feb 1990 (fl), C.E. Cerón, M. Crizón & C. Iguago 8667 (HOLOTYPE: QCNE; ISOTYPES: F, MO, SEL).

Arbor; foliis anguste ellipticis, ellipticis vel obovatis, chartaceis, puberulis, abrupte caudato-acuminatis, subtus fusco-glandulosis, nervo medio supra sulcato; racemis abbreviatis, adpresso-pubescentibus, pedicellis gracilibus, floribus pusillis; fructis globosis.

Tree 6–15 m tall; trichomes, where present, yellowish-white; branchlets smooth, puberulous, dark-dotted. **Leaf blades** narrowly elliptic to elliptic or obovate, chartaceous, 5.5–7.5 × 2–3.3 cm, drying olive-green or greenish-brown above, light yellowish-green below, puberulous on both surfaces, especially by the midvein, glabrescent; glands dark, convex on both surfaces or indistinct above; midvein sulcate on the upper surface; lateral veins ca. 10 pairs, indistinct above, slightly convex below; marginal veins 2, the innermost similar to the lateral veins in prominence, slightly arched, ca. 1 mm from the margin; apex abruptly caudate-acuminate, the acumen 1–1.5 cm long; base cuneate to obtuse; petioles 4–6 mm long, sulcate, puberulous to glabrous. **Inflorescences** of short racemes, with 4–8 flowers, axillary or subterminal, the main axis 1–4 mm long, quadrangular in cross-section, the pedicels 4–7 mm long, slender, appressed-pubescent; bracteoles ovate, to 1 mm long, appressed-puberulous, persistent. **Flowers** 4-merous; buds ca. 1.5 mm long; hypanthium ca. 1 mm long, appressed-pubescent; calyx lobes ovate, 0.4–0.8 mm long, in slightly unequal pairs, acute to obtuse, appressed-puberulous without, ciliate; petals suborbicular, ca. 2 mm diam., ciliate; disk ca. 1 mm diam., puberulous; stamens ca. 3 mm long; style ca. 3 mm long; ovary 2-locular, with several ovules per locule. **Fruits** berries, globose, 7–9 mm diam., glabrous, dark-red to purple, gland-dotted; seed 1, ca. 6–7 × 5 mm, the seed coat membranous; embryo eugenioid, the cotyledons fleshy, connate, the radicle indistinct.

Distribution.—Eugenia pusilliflora has been collected in the provinces of Napo, Orellana, and Pastaza, in primary rain forests at 200–430 m elevation.

Eugenia pusilliflora is characterized by the small, elliptic to obovate, abruptly caudate-acuminate leaves, dark-dotted below and with sulcate midvein on the upper surface; the inflorescences are short racemes with very small flowers and slender pedicels that are longer than the main inflorescence axis. In the shape of leaves, type of inflorescence, and size of flowers, Eugenia pusilliflora is similar to E. protenta McVaugh, a species from Venezuela and northern Brazil (Amazonas). The two species may be distinguished by these characters: the leaves of E. pusilliflora are puberulous (vs. glabrous), distinctly dark-dotted on the lower surface (vs. glands indistinct), chartaceous (vs. coriaceous), with sulcate midvein (vs. sulcate to plane); the axis of the inflorescences and bracteoles are yellowish-pubescent (vs. glabrous to sparsely rufous-pubescent), and the hypanthium is appressed-pubescent (vs. glabrous).

Additional collections examined: **ECUADOR. Napo:** 9 km downstream Puerto Misahuallí, 2 km S of Chinguipino river basin, 01°05′S, 77°36′W, 430 m, 10 Mar 1985 (fl), *D. Neill et al.* 6063 (MO, SEL); Tena Cantón, Jatun Sacha Biological Station, 8 km E of Misahuallí, 01°04′S, 77°36′W, 400 m, 21 Sep 1990 (fr), *D. Neill 9465* (F, MO, SEL); Tena Cantón, Jatun Sacha Biological Station, S of Río Napo, 8 km E of Misahuallí, 01°04′S, 77°36′W, 400 m, 17 Sep 1992 (fr), *D. Neill & J. Zuleta 10131* (F, MO, SEL); Tena Cantón, Ahuano, 01°03′S, 77°32′W, 380 m, 10 Sep 1992 (fr), *W. Palacios et al.* 10438 (F, MO, QCNE, SEL). **Orellana:** Yasuní Forest Reserve, along road between Km 70 and 100, E of PUCE Scientific Station, 00°50.014′S, 76°20.518′W to 00°50.730′S, 76°13.304′W, 200 m, 2 Jul 1995 (fr), *P. Acevedo-Rodríguez & J.A. Cedeño* 7633 (SEL); Aguarico, Reserva Etnica Huaorani, Maxus road and oil well in construction, Km 102–105, 00°56′S, 76°13′W, 248 m, 24–31 Jul 1994 (fr), *A. Dik 1491* (F, MO, SEL); Aguarico, Reserva Etnica Huaorani, Maxus road and pipeline construction project, Km 99–100, 00°56′S, 76°13′W, 250 m, 9 Jul 1994 (fr), *N. Pitman 510* (SEL); Aguarico, Reserva Etnica Huaorani, Maxus road and pipeline construction project, Km 99–100, 00°56′S, 76°13′W, 250 m, 10 Jul 1994 (fr), *N. Pitman 515* (F, MO, SEL); Estación Cientifica Yasuní, Río Tiputini, NW of the confluence with Río Tivacuno, E of road Repsol-YPF, Km 7, detour to Tivacuno well, 00°38′S, 76°30′W, 200–300 m, 12 Feb 2002 (fl), *G. Villa et al.* 1302 (SEL); Parque Nacional Yasuní, Río Tiputini, NW of confluence with Río Tivacuno, E of road Repsol-YPF, Km 32 to NPF, Guiyerc, 00°38′S, 76°30′W, 200–300 m, 17 Jun 2002 (fr), *G. Villa et al.* 1540 (F, QCA, SEL). **Pastaza:** Oil well "Golondrina", PETRO-CANADA, 30 km NW of Curaray, 01°10′S, 77°06′W, 400 m, 10 Jul 1989 (fr), *E. Gudiño 8* (F, MO, SEL).

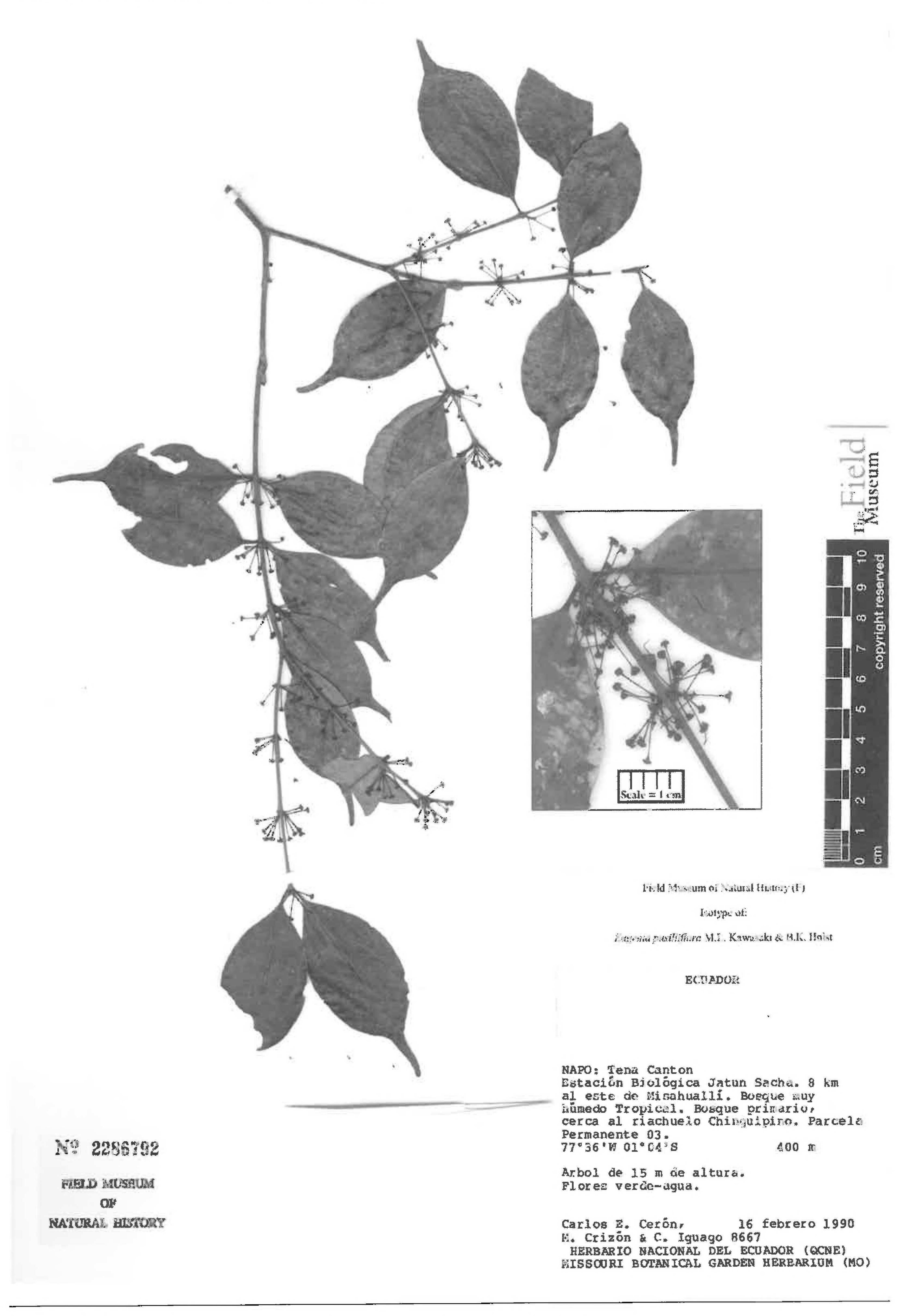


Fig. 5. Eugenia pusilliflora M.L. Kawasaki & B.K. Holst (Cerón et al. 8667: Isotype, F; inset from isotype at SEL).

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